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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,277	09/11/2003	Fumihiro Haga	50340-157	5638

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EXAMINER	
LEWIS, BEN	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/659,277	HAGA, FUMIHIRO	
	Examiner	Art Unit	
	Ben Lewis	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 11 September 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 8/25/05, 9/11/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 10 and 11 are objected to because of the following informalities: The phrase "selected from the group consisting of" should be used instead of "from a group including." Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,3, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki et al. (Japanese Pub. No. 2000-036314).

With respect to claim 1, Komaki et al. disclose a fuel reformer with recirculation line (title).

With regards to the hydrogen supply passage for connecting the reformer and the fuel cell stack, Komaki et al teach that the reforming gas line 4 is formed in the fuel electrode of a fuel cell 2 from reforming section 1a (Paragraph 0016).

With regards to a recirculation passage connecting the reformer and the combustor, Komaki et al teach that a recycling line 3 connecting reformer and combustor 21 (Paragraph 0023) (See Fig 4).

With regards to a recirculation device, Komaki et al teach that recycling blower is used in recirculation line 3 (Paragraph 0017) (See Fig. 1).

With regards to a device for selecting an operation mode and a controller for controlling the supply device and recirculation device. Komaki et al teaches that the fuel cell 2 is stopped (during a shut-down operation) and fuel supply valve 16 and water supply valve 17 and reforming machine outlet valve 18 are closed. The outlet valve 14 and inlet valve 15 are opened and condenser 11 and recycling blow 12 are worked (Paragraph 0018). Komaki et al is silent as to whether a controller is actuating these operations. However, providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art. In re Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958).

With respect to claim 3, Komaki et al teaches that a condenser 11 cools gas in recycling line 3 with cooling water (Paragraph 0017).

4. Claim 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki et al. (Japanese Pub. No. 2000-036314) in view of Iio et al. (U.S. Patent No. 6,841,280 B2).

With respect to claim 2, Komaki et al teaches that the fuel cell 2 is stopped (during a shut-down operation) and fuel supply valve 16 and water supply valve 17 and reforming machine outlet valve 18 are closed. The outlet valve 14 "recirculation control valve" and inlet valve 15 are opened and condenser 11 and recycling blow 12 are worked (Paragraph 0018). Komaki et al teach that recycling blower is used in recirculation line 3 (Paragraph 0017). Komaki et al does not specifically teach a discharge line allowing flow of discharged gas from the combustor to the outside of the combustor and a discharge valve disposed on the discharge line. However, Iio disclose a fuel cell power plant wherein, a combusted gas supply passage 21 and valves 31 and 42 are provided in order to supply combusted gas from the combustor 1 introduced into the vaporizer 3 to the hydrogen supply passage 25 instead of the intake valve 30 in the first embodiment. The valve 31 is provided in the combusted gas supply passage 21 and the valve 42 is provided in a discharge passage 43 which discharges combusted gas from the vaporizer 3 into the atmosphere. The valves 31 and 42 are operated by the controller 10 (Col 6 lines 20-30). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a discharge passage with valve of Iio et al. into the fuel cell system of Komaki et al, because Iio et al teach that the valve 42 is provided in a discharge passage 43 which discharges combusted gas from the vaporizer 3 into the atmosphere (Col 6 lines 20-30). This would relieve any excess pressure buildup in the system and exhaust spent gasses.

With respect to claim 7, Komaki et al, teach that the moisture generated by combustion is removed by condenser 11 as a drain. Since there is less oxygen in the reformed gas than hydrogen, combustion will stop and moisture generation will cease. The condenser 11 and maximum circulation blower 13 are stopped.

5. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki et al. (Japanese Pub. No. 2000-036314) in view of Takamura et al. (U.S. Pub. No. 2001/0016275 A1).

With respect to claim 4, Komaki et al. disclose a fuel reformer with recirculation line (title) in paragraph 3 above. Komaki et al. does not specifically teach a sensor for detecting the temperature of the combustor and wherein the controller functions to control the temperature of the combustor. However, Takamura disclose a fuel cell system wherein, the quantity of the reforming gas generated increases with an increase in the feed rate of the reforming fuel in the step S70, the temperature of the combustion gas in the combustor 22 is measured by the temperature sensor 28 in the step S100, and the flow rate of the air supplied from the compressor 12 is adjusted to control the temperature of the combustor 22 (Paragraph 0040). Takamura also teach that the compressor 12, the pumps 14 and 17, the flow rate adjusting valves 15, 18, 23, 24, and 32, and the three-way valve 21, which are described above, are controlled by the controller 31 (Paragraph 0030). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the combustor temperature sensing and controlling means of Takamura into the fuel cell system of

Komaki et al because Takamura teach that the temperature sensor 28 in the step S100, and the flow rate of the air supplied from the compressor 12 is adjusted to control the temperature of the combustor 22 (Paragraph 0040).

With respect to claim 5, Takamura teach that the quantity of the reforming gas generated increases with an increase in the feed rate of the reforming fuel in the step S70, the temperature of the combustion gas in the combustor 22 is measured by the temperature sensor 28 in the step S100, and the flow rate of the air supplied from the compressor 12 is adjusted to control the temperature of the combustor 22 (Paragraph 0040). Takamura also teach that the compressor 12, the pumps 14 and 17, the flow rate adjusting valves 15, 18, 23, 24, and 32, and the three-way valve 21, which are described above, are controlled by the controller 31 (Paragraph 0030). Simultaneously with the supply of the reforming fuel and the air, the combustion air is supplied to the combustor 22 while adjusting the flow rates of the combustion air by the flow rate adjusting valve 24 (S10 to S40) (Paragraph 0032).

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki et al. (Japanese Pub. No. 2000-036314) in view of Iio et al. (U.S. Patent No. 6,841,280 B2) as applied to claim 2 above and further in view of Takamura (U.S. Pub. No. 2001/0016275A1.

With respect to claim 6, Komaki et al as modified by Iio et al teach a fuel cell system in paragraph 4 above. The do not specifically teach detecting the temperature of the combustor and sending a corresponding signal to the controller and an air vale for introducing air into the combustor. However, Takamura disclose a fuel cell system wherein, the quantity of the reforming gas generated increases with an increase in the feed rate of the reforming fuel in the step S70, the temperature of the combustion gas in the combustor 22 is measured by the temperature sensor 28 in the step S100, and the flow rate of the air supplied from the compressor 12 is adjusted to control the temperature of the combustor 22 (Paragraph 0040). Takamura also teach that the compressor 12, the pumps 14 and 17, the flow rate adjusting valves 15, 18, 23, 24, and 32, and the three-way valve 21, which are described above, are controlled by the controller 31 (Paragraph 0030). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the combustor temperature sensing and controlling means of Takamura into the fuel cell system of Komaki et al as modified by Iio et al. because Takamura teach that the temperature sensor 28 in the step S100, and the flow rate of the air supplied from the compressor 12 is adjusted to control the temperature of the combustor 22 (Paragraph 0040).

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki et al. (Japanese Pub. No. 2000-036314) in view of Takamura et al. (U.S. Pub. No. 2001/0016275 A1).

With respect to claim 8, Komaki et al. disclose a fuel reformer with recirculation line (title) in paragraph 3 above. Komaki et al. does not specifically teach a carbon monoxide removal section, an air valve for regulating the air amount supplied to the carbon monoxide removal section and a controller functioning to control the air valve for the carbon monoxide removal section. However, Takamura disclose a fuel cell system wherein the entrance of the carbon monoxide remover 20 is risen to a predetermined value by the temperature sensor 26 provided in the entrance of the carbon monoxide remover 20. Here, if the carbon monoxide remover 20 is risen to the predetermined value in terms of the temperature, an oxidation reaction is possible by supplying the air to the carbon monoxide remover 20. Accordingly, after this confirmation, the oxidation air from the compressor 12 is supplied to the carbon monoxide remover 20 while adjusting the quantity of the oxidation air by the flow rate adjusting valve 23, in the step S90 (Paragraph 38). Takamura also teach that the compressor 12, the pumps 14 and 17, the flow rate adjusting valves 15, 18, 23, 24, and 32, and the three-way valve 21, which are described above, are controlled by the controller 31 (Paragraph 0030). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the carbon monoxide removal section with sensing and controlling means of Takamura into the fuel cell system of Komaki et al because Takamura teach that to prevent the fuel cell stack from being corrupted, on the downstream side of the reformer 11, provided is a carbon monoxide remover 20 for reducing carbon monoxide contained in the reforming gas, which is generated by the reformer 11, to an allowable concentration (Paragraph 0026).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komaki et al. (Japanese Pub. No. 2000-036314) in view of Takamura et al. (U.S. Pub. No. 2001/0016275 A1).

With respect to claim 9, Komaki et al. disclose a fuel reformer with recirculation line (title) in paragraph 3 above. Komaki et al. does not specifically teach a bypass passage for directly transferring gas from the reformer to the combustor and a directional control valve for selecting the direction of gas flow from the reformer. However, Takamura disclose a fuel cell system wherein the carbon monoxide remover 20 is supplied to the fuel cell system 1 by switching the three-way valve 21, and air as the oxidizing agent is supplied from the compressor 12 thereto. Thus, high temperature combustion gas is generated, and the combustion gas generated is supplied to the evaporator 19 provided on the downstream side of the combustor 22, whereby the evaporator 19 is heated. Finally, the combustion gas is exhausted to the outside of the system (Paragraph 0027). Takamura also teach that the compressor 12, the pumps 14 and 17, the flow rate adjusting valves 15, 18, 23, 24, and 32, and the three-way valve 21, which are described above, are controlled by the controller 31 (Paragraph 0030). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bypass passage of Takamura into the fuel cell system of Komaki et al because Takamura teach that high temperature combustion gas is generated (Paragraph 0027).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Susy Tsang Foster

Ben Lewis

SUSY TSANG-FOSTER
PRIMARY EXAMINER

Patent Examiner
Art Unit 1745